



# 18th NITROGEN WORKSHOP

## **THE NITROGEN CHALLENGE: BUILDING A BLUEPRINT FOR NITROGEN USE EFFICIENCY AND FOOD SECURITY**

**18th Nitrogen Workshop**

**PROCEEDINGS**

**Lisbon, Portugal, 30th June – 3rd July 2014**

**Editor: Cláudia M. d. S. Cordovil**



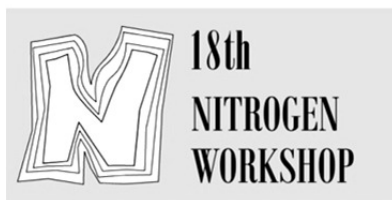
INSTITUTO  
SUPERIOR DE  
AGRONOMIA  
*Universidade de Lisboa*

**THE NITROGEN CHALLENGE:  
BUILDING A BLUEPRINT FOR NITROGEN  
USE EFFICIENCY AND FOOD SECURITY**

**Sponsors:**

The 18<sup>th</sup> Nitrogen Workshop was organized by the Instituto Superior de Agronomia of the Universidade de Lisboa, and supported by Central de Cervejas, Delta cafés, Unicer and Pastéis de Belém





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Proceedings of the 18<sup>th</sup> Nitrogen Workshop

Edited by: Cláudia S. C. Marques dos Santos Cordovil

Lisboa, Portugal, 30th June – 3rd July 2014

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Printed by: Colibri Artes Gráficas

Edited by: Cláudia S.C. Marques dos Santos Cordovil

Design and composition:

Gonçalo Cordovil

Cláudia S.C. Marques dos Santos Cordovil

ISBN: 978-972-8669-56-0

Depósito legal n.º 377 322/14

Edição:



**Suggested citation:** Author(s), 2014. Title. In: Cordovil C. M. d. S. (Ed.). Proceedings of the 18<sup>th</sup> Nitrogen Workshop – The nitrogen challenge: building a blueprint for nitrogen use efficiency and food security. 30<sup>th</sup> June – 3<sup>rd</sup> July 2014, Lisboa, Portugal, pp. nn-nn.

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## **NITROGEN WORKSHOP – A leading network on Nitrogen**

On the behalf of the organizing Commission of the 18<sup>th</sup> Nitrogen Workshop, I wish to express a warm welcome to all the participants.

This book contains the proceedings of the 18<sup>th</sup> Nitrogen Workshop, held in Lisboa, Portugal, from 30<sup>th</sup> June to 3<sup>rd</sup> July 2014.

The Nitrogen Workshop is a leading network on all issues related to Nitrogen, since 1982. From an European network, the Nitrogen workshop grew to an international network, integrating more and more countries and enlarging its focus to broader questions about Nitrogen.

There was a global participation of scientists and technicians, from 30 different countries from all the continents, who presented the results of their collaborative work. This is a clear sign of the importance of these workshops and stressed out the leading position of this network in the field of the challenging Nitrogen element. The doors are open to the growth of the network.

We are proud to present an outstanding scientific program with high quality speakers and innovative posters presented by more than 200 delegates, which will hopefully give rise to interesting and participated discussions. We have put our efforts in the selection of an innovative and comprehensive overview of the latest research developments to share with you and we hope you enjoy the workshop. More that 200 posters were displayed in large poster sessions, to allow the participants the exchange of ideas and information amongst them. It is worth highlighting a strong participation of students which ensure and keep alive the research in the subject of Nitrogen.

We hope that this Workshop will host great opportunities for the participants to meet and build future collaboration through friendship and professional interaction, and that this may be place and time for discussing the latest developments in science and politics for Nitrogen issues, and a means of moving forward to problem solving, innovation and knowledge transfer.

We wish to express sincere thanks to all the persons that made the 18<sup>th</sup> Nitrogen Workshop possible. To the colleagues who kindly accepted to revise the abstracts submitted to this Workshop, to the Chair of the 17<sup>th</sup> Nitrogen Workshop for his advice, availability and support at all times, to the Steering Committee of the International Nitrogen Initiative (INI) for scientific advice and to the European Centre of the INI for supporting this meeting.



Cláudia S. C. Marques dos Santos Cordovil

## **History of the Nitrogen Workshop**

### **“The nitrogen challenge: building a blueprint for food and future”**

- 17<sup>th</sup> International Nitrogen Workshop: Wexford, Ireland. “Innovations for sustainable use of N resources”.
- 16th International Nitrogen Workshop: Università Degli Studi di Torino, Italy. 28 June - 1 July 2009. “Connecting different scales of nitrogen use in agriculture
- 15th International Nitrogen Workshop: University of Lleida, Spain. 28-30 May 2007. “Towards a better efficiency in N use”
- 14th International Nitrogen Workshop: PRI, Maastricht, The Netherlands. 24-26 October 2005. “N Management in Agrosystems in Relation to the Water Framework Directive”.
- 12th International Nitrogen Workshop: IGER, University of Exeter, UK. 21-24 September 2003. “Controlling nitrogen flows and losses”.
- 11th International Nitrogen Workshop: INRA, Reims, France. 9-12 September 2001
- 10th International Nitrogen Workshop: The Royal Veterinary & Agricultural Univ Copenhagen, Denmark. 23-26 August 1999
- 9th International Nitrogen Workshop: Technische Universität Braunschweig, Germany. 9-12 September 1996
- 8th International Nitrogen Workshop: University of Ghent, Belgium. 5-8 September 1994.
- 7th International Nitrogen Workshop: University of Edinburgh, UK. 3-26 June 1992
- 6th International Nitrogen Workshop: The Queen’s University Belfast, UK. 17-19 December 1990
- 5th International Nitrogen Workshop: Rothamsted Experimental Station, UK. 13-14 December 1988
- 4th International Nitrogen Workshop: University of Aberdeen, UK. 6-9 April 1987
- 3rd International Nitrogen Workshop: GRI, University of Reading, UK. 16-17 December 1985
- 2nd International Nitrogen Workshop: Rothamsted Experimental Station, UK. 17 July 1984
- 1st International Nitrogen Workshop: Rothamsted Experimental Station, UK. 20 July 1982

# 18<sup>th</sup> Nitrogen Workshop

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# ÍNDICE

## Topic 1

### Nitrogen use in agriculture

IMPACT OF NITROGEN FERTILIZER RATES ON INDUSTRIAL HEMP (CANNABIS SATIVA L.) BIOMASS PRODUCTION A. ADAMOVICS, O. ADAMOVIĆA, M. KATAMADZE .....	27
NITROGEN USE EFFICIENCY IN INTENSIVE VEGETABLE GROWING: WHAT'S THE POTENTIAL OF ALTERNATIVE CROP ROTATIONS? L. AGNEESSENS, B. VANDECASTEELE, T. VAN DE SANDE, S. CRAPPÉ, J. DE NIES, A. ELSÉN, S. DE NEVE .....	29
EVALUATION OF AMMONIUM NITRIFICATION IN THE PRESENCE OF DMPP NITRIFICATION INHIBITOR IN SOLUTION IN THE SOIL OF CITRUS TREES UNDER FIELD CONDITIONS D. ALONSO, A. QUIÑONES, B. MARTÍNEZ-ALCÁNTARA, E. ALCAYDE.....	31
RESIDUAL INORGANIC NITROGEN CONTENT IN SOILS FROM INTENSIVE FARMS IN SOUTH BULGARIA A. KATSAROVA, SOFIA BULGARIA.....	34
AGRONOMIC AND ENVIRONMENTAL PERFORMANCES OF ORGANIC FARMING IN THE SEINE WATERSHED: TURNING BACK OR MOVING FORWARD? J. ANGLADE, G. BILLEN, J. GARNIER.....	36
INTERCROPPING LEGUME AND NON-LEGUME, AN INNOVATIVE WAY TO VALORIZE N <sub>2</sub> FIXATION AND SOIL MINERAL N SOURCES IN LOW INPUTS CROPPING SYSTEMS L. BEDOUSSAC, E.P. JOURNET, H. HAUGGAARD-NIELSEN, C. NAUDIN, G. CORRE-HELLOU, L. PRIEUR, E.S. JENSEN, E. JUSTES .....	38
INCREASING SMALLHOLDER CEREAL PRODUCTION IN THE HUMID HIGHLANDS OF ETHIOPIA VIA N-EFFICIENT FABIA BEAN (VICIA FABIA L.) – WHEAT ROTATIONS A. NEBIYU, J. DIELS, P. BOECKX .....	40
FERTILISER EFFECTS ON ORGANIC WHITE CABBAGE GROWTH AND NUTRIENT UPTAKE L. BRITO, J. MONTEIRO, I. MOURÃO, J. COUTINHO .....	42
EFFECT OF NUTRIENT ADDITION ON SOIL RESPIRATION IN MEDITERRANEAN GRASSLAND C. NOGUEIRA, R.L. MCCULLEY, D. FANGUEIRO, X. LECOMTE, M. BUGALHO, M.C. CALDEIRA.....	44
STATISTICAL MODEL IMPACTS ON NITROGEN RECOMMENDATION, POTATO YIELD, NITROGEN UPTAKE EFFICIENCY AND RESIDUAL SOIL NITRATE A. CAMBOURIS, B.J. ZEBARTH, N. ZIADI, C. GRANT .....	46
NITROGEN USE EFFICIENCY IN A SOIL AMENDED WITH DIFFERENT ORGANIC RESIDUES J. CARNEIRO, J. COUTINHO, H. TRINDADE.....	48
EFFECTS OF TREES ON N <sub>2</sub> FIXATION AND SOIL RHIZOBIUM ABUNDANCE IN AGROFORESTRY SYSTEMS C. CARRANCA, I. CASTRO, N. FIGUEIREDO, R. REDONDO, A.R. RODRIGUES, R. MARICATO, M.A. MADEIRA .....	50
MAIZE NITROGEN RECOVERY AFTER APPLICATION OF A DIGESTED DAIRY COW SLURRY, ITS LIQUID AND SOLID FRACTIONS, AND OF A DAIRY COW SLURRY D. CAVALLI, G. CABASSI, L. BORRELLI, G. GEROMEL, L. DEGANI, L. BECHINI, P. MARINO .....	53
RELEASE OF PLANT AVAILABLE NITROGEN FROM THE SOLID FRACTION OF TWO DIGESTATES D. CAVALLI, G. CABASSI, L. BECHINI, D. DITTO, P. MARINO GALLINA .....	55

ROOT SOCIALIZATION: THE BASIS FOR IMPROVED PRODUCTIVITY AND NUTRIENT USE EFFICIENCY P. CORREIA, M. CAROLINO, J. DORES, J. PATANITA, M. DELGADO, J. CASTRO PINTO, A. DE VARENNES, L. MESQUITA, C. CRUZ, L. CARVALHO .....	57
VARIATION IN NITROGEN CYCLES ON DUTCH DAIRY FARMS C. DAATSELAAR, J. REIJS, J. OENEMA, G. DOORNEWAARD, F. AARTS .....	59
AZOFERT®: A DYNAMIC DECISION SUPPORT TOOL FOR FERTILIZER N ADVICE ADAPTED FOR ORGANIC PRODUCTS AND CATCH CROPS J.M. MACHET, C. LE ROUX, N. DAMAY .....	62
PREDICTING YEAR-YEAR, FIELD LEVEL VARIATION IN MAIZE NITROGEN FERTILIZER REQUIREMENT B. DEEN, K. JANOVICEK, T. BRUULSEMA, J. LAUZON .....	65
RESIDUAL SOIL MINERAL NITROGEN IN FUNCTION OF APPLIED EFFECTIVE AND CROP AVAILABLE NITROGEN K. D'HAENE, J. SALOMEZ, S. DE NEVE, J. DE WAELE, G. HOFMAN .....	68
ASSESSMENT OF SOIL-ATMOSPHERE N <sub>2</sub> O EXCHANGE IN PRE-ALPINE GRASSLANDS AND IMPORTANCE OF THE MONITORING TEMPORAL RESOLUTION E. DIAZ PINES, H. LU, K. BUTTERBACH-BAHL, R. KIESE.....	70
IMPROVED PIG SLURRY AND CO-DIGESTATE MECHANICAL SEPARATION USING POLYMERS AND BIOCHAR O. POPOVIC, E. DINUCCIO, F. GIOELLI, P. BALSARI .....	72
NITROGEN LEACHING IN AUSTRIA – LONG-TERM LYSIMETER STUDIES FOR EVALUATION OF LEACHING FACTORS FOR TYPICAL MANAGEMENT PRACTICES ON GRASSLAND AND CROPLAND A. EDER, F. FEICHTINGER, P. STRAUSS, G. BLÖSCHL .....	75
INCORPORATION OF ORGANIC FERTILISERS IN SPRING TO WINTERWHEAT L. ENGSTRÖM, S. DELIN.....	77
COUPLING MINERAL N AND SIMPLE MICROBIOLOGICAL INDICES IN SOIL INCUBATIONS TO INTERPRET N MINERALIZATION IN FIELD CONDITIONS N. FIORENTINO, V. VENTORINO, C. BERTORA, L. ZAVATTARO, C. GRIGNANI, O. PEPE, M. FAGNANO .....	79
TWENTY-FIVE YEARS OF LYSIMETER EXPERIMENTS IN THE CZECH REPUBLIC M. FLORIÁN, V. KLEMENT, M. SMATANOVÁ, R. PRCHALOVÁ.....	82
AGRONOMIC EFFICIENCY, ENVIRONMENTAL BEHAVIOUR AND SOIL AMMONIA OXIDIZERS AS AFFECTED BY ORGANO-MINERAL FERTILIZATION A. FLORIO, B. FELICI, M. MIGLIORE, M.T. DELL'ABATE, A. BENEDETTI.....	84
EFFECT OF NITRIFICATION INHIBITOR (DMPP) IN PEACH FRUIT QUALITY F. FONSECA SALCEDO, J. LORDAN, J. PAPIO, V. MONTILLA, M. PACUAL, J. RUFAT, I. CARRASCO, J.M. VILLAR .....	86
ASSESSMENT OF POTENTIAL ENVIRONMENTAL BENEFITS OF LOW N-INPUT GIANT REED LIGNOCELLULOSIC FEEDSTOCK PRODUCTION THROUGH THE LCA APPROACH. A. FORTE, A. ZUCARO, M. FAGNANO, A. FIERRO .....	89
NITROGEN TRANSFER BETWEEN COMPANION CROPS IN ANNUAL LEGUME-BASED INTERCROPS J. FUSTEC, M. JAMONT, F. X. JOLY, G. PIVA, M. CANNAVACCIUOLO, N. CASSAGNE .....	92
GROUND AND AIRBORNE LEVEL OPTICAL SENSORS: IS IT POSSIBLE TO ESTIMATE MAIZE CROP N STATUS? J. GABRIEL, P. ZARCO, M. QUEMADA.....	94
MODIFICATION OF THE NITROGEN MINERALIZATION CAPACITY OF SURFACE AND SUBSURFACE LAYERS OF AFFORESTED SOILS E. GARCÍA CAMPOS, M.C. LEIRÓS, F. GIL SOTRES, C. TRASAR CEPEDA.....	96

ESTIMATION OF NUTRIENT VALUE OF SLURRY IN DAIRY FARMS IN GALICIA FROM THE DENSITY AND ELECTRICAL CONDUCTIVITY M. GARCÍA POMAR, D. BÁEZ BERNAL, J. CASTRO INSUA, C. GILSANZ REY .....	98
FIRST 20 YEARS OF DNDC: MODEL EVOLUTION AND GRAMP S. GILHESPY, S. ANTONY, L.M. CARDENAS, D.R. CHADWICK, A. DEL PRADO, C. LI, T.H. MISSELBROOK, R. REES, W. SALAS, A. SANZ-COBENA, P. SMITH, E.L. TILSTON, K. TOPP, S.H. VETTER, J. YELURIPATI.....	100
DEVELOPING A TOOL TO COMPARE NITROGEN USE EFFICIENCY OF DIVERSIFIED FARMING SYSTEMS O. GODINOT, M. CAROF, F. VERTES, P. LETERME .....	103
MULTIVARIATE ADAPTIVE REGRESSION SPLINES TO SIMULATE SOIL NO <sub>3</sub> CONTENT UNDER POTATO (SOLANUM TUBEROSUM L.) CROP J. GOULET-FORTIN, F. ANCTIL, LE PARENT .....	105
GOOD MANAGEMENT PRACTICES EFFECT ON N UPTAKE AND SURPLUS: AN OVERVIEW OF EUROPEAN LONG TERM TRIALS C. GRIGNANI, L. ZAVATTARO, C. COSTAMAGNA, L. BECHINI, A. SPIEGEL, G. GUZMAN, J. KRUGER, T. D'HOSE, A. PECIO, F. VAN EVERT, H. TEN BERGE, T.M. LEHTINEN.....	107
CROP ROTATION AND RESIDUES INFLUENCE N <sub>2</sub> O EMISSION AND N EFFICIENCY RATHER THAN TILLAGE UNDER A RAINFED MEDITERRANEAN AGRO-ECOSYSTEM G. GUARDIA, A. TELLEZ-RIO, S. GARCIA-MARCO, J.L. TENORIO, A. VALLEJO .....	109
NITROGEN AND OZONE INTERACTIVE EFFECTS ON THE NUTRITIVE QUALITY OF ANNUAL PASTURES H. CALVETE SOGO, R. MUNTIFERING, R. ALONSO, L. SANCHEZ, H. GARCIA GOMEZ, S. ELVIRA, J. SANZ, I. GONZALEZ-FERNANDEZ, V. BERMEJO BERMEJO .....	111
THE SIMULATED IMPACT OF DIFFERENT FERTILIZATION SYSTEM ON YIELD AND THE UTILIZATION OF NITROGEN FROM WHEAT ROOT ZONE LAYERS UNDER SHORTAGE OF WATER J. HABERLE, P. SVOBODA.....	113
EFFECTS OF LEGUMINOUS COVER CROPS ON SPRING BARLEY PRODUCTION ON A LIGHT TEXTURED SOIL IN IRELAND R. HACKETT .....	115
STABILISATION OF RED CLOVER NITROGEN RHIZODEPOSITION IN DENSITY FRACTIONS OF SOILS WITH DIFFERENT FERTILIZATION HISTORIES A. HAMMELEHLE, A. OBERSON, A. LÜSCHER, E. FROSSARD, S.M. BERNASCONI, P. MÄDER, J. MAYER .....	117
EXPLORING OPTIMAL FERTIGATION STRATEGIES FOR ORANGE PRODUCTION, USING COMBINED SOIL-CROP MODELLING M. HEINEN, F.B.T. ASSINCK, W. QIN, O. OENEMA .....	119
WATER AND NITROGEN INTERACTIONS IN ORANGE PRODUCTION: A META-ANALYSIS W. QIN, F.B.T. ASSINCK, M. HEINEN, O. OENEMA .....	121
EFFECTS OF DROUGHT AND LEGUME CONTENT ON GRASSLAND NITROGEN YIELD AND SYMBIOTIC N <sub>2</sub> FIXATION N. HOEKSTRA, J.A. FINN, A. LÜSCHER .....	123
RESIDUAL SOIL MINERAL NITROGEN AS A READILY AVAILABLE SOURCE TO CROPS IN AN IRRIGATED MEDITERRANEAN AREA H. IBRIKCI, G. KOCA, M. CETIN, E. KARNEZ, K. KOCA.....	125
FODDER VALUE IN WINTER TRITICALE VARIETIES FEPENDING ON PRODUCTION TECHNOLOGY B. JASKIEWICZ .....	127
NITROGEN USE EFFICIENCY IN NATURAL ECOSYSTEMS AND LOW INPUT AGRICULTURAL SYSTEMS K. VAN DER HOEK .....	129

INFLUENCE OF NITROGEN FERTILISATION ON CARBON AND NITROGEN MINERALISATION, MICROBIAL BIOMASS AND SOIL RESPIRATION IN GRASSLAND SOILS C. KNOBLAUCH, C. WATSON, N. WRAGE-MÖNNIG, R. BECKER, C. BERENDONK, F. WICHERN .....	131
NITROGEN MINERALIZATION OF SUGARBEET VINASSES IN INTERACTION WITH CATCH CROPS C. LE ROUX, J.M. MACHET, N. DAMAY .....	133
EVALUATION OF LABORATORY AND FIELD INCUBATION TO PREDICT NITROGEN FERTILIZATION IN AN ORGANIC HORTICULTURAL ROTATION R. MACHADO PINTO, L.M. BRITO, J. COUTINHO.....	135
ENVIRONMENTAL IMPACTS OF MAIZE CULTIVATION IN DENMARK AND IN NORTH CHINA PLAIN K. MANEVSKI, C.D. BØRGENSEN, X. LI, C. HU, I.S. KRISTENSEN, M.N. ANDERSEN .....	137
INFLUENCE OF NITRIFICATION INHIBITOR DMPP ON YIELD, FRUIT QUALITY AND SPAD VALUES OF STRAWBERRY PLANTS F. MARTÍNEZ RUIZ, P. PALENCIA GACÍA, C. MARÍA WEILAND, D. ALONSO, J. ALBERTO OLIVEIRA .....	139
ARE REDUCTION OF NITROGEN POLLUTION AND QUALITY REQUIREMENTS IN AGRO-FOOD CHAIN COMPATIBLE? M. MAWOIS, C. NAUDIN, F. COSTE.....	141
IMPACT OF FERTILIZATION HISTORY ON RED CLOVER BELOW GROUND NITROGEN INPUTS IN A CLOVER-GRASS LEY AND N-TRANSFER TO GRASS J. MAYER, A. OBERSON, A. LÜSCHER, E. FROSSARD, S.M. BERNASCONI, P. MÄDER, A. HAMMELEHLE.....	143
GRASS-FUNGAL ENDOPHYTE SYMBIOSES EFFECTS ON NITROGEN FIXATION AND DYNAMICS IN A KENTUCKY PASTURE R. MCCULLEY .....	145
NITROGEN DINAMICS IN SOILS: THE EFFECT OF DIFFERENT PRACTICES AND THE ROLE OF MICROBIOTA ON N OXIDATION AND REDUCTION S. MOTTA, M. ZANARDO, A. SQUARTINI, F. ADANI.....	146
REDUCING SOIL N TRANSFORMATION OF UREA BY A BIOLOGICAL INHIBITORS OF UREASE ACTIVITY C. MUÑOZ, N. MEDINA, F. WEISSER.....	149
TRANSFER PROCESSES OF C AND N FROM PEAS TO CEREALS F. NAETHER, A. SCHMIDT, L. HANS, C. BRUNS, J. HEB, R. G. JOERGENSEN, T. HAASE, F. WICHERN .....	151
ENZYME ACTIVITY AND MICROBIAL DIVERSITY IN THE RHIZOSPHERE OF TWO MAIZE LINES DIFFERING IN N USE EFFICIENCY S. I. PATHAN, M. T. CECCHERINI, G. PIETRAMELLARA, M. PUSCHENREITER, L. GIAGNONI, M. ARENELLA, Z. VARANINI, P. NANNIPIERI, G. RENELLA .....	153
INHIBITION AND RECOVERY OF SYMBIOTIC N <sub>2</sub> FIXATION BY PEAS (PISUM SATIVUM L.) IN RESPONSE TO SHORT-TERM NITRATE EXPOSURE C. NAUDIN, A.S. VOISIN, C. SALON, G. CORRE-HELLOU, M.H. JEUFFROY .....	154
CANOLA RESPONSE TO N FERTILIZER AND ROTATION SYSTEMS IN PRINCE EDWARD ISLAND J. NYIRANEZA, R. PETERS, M.G. GRIMMETT, Y. YANG, V. RODD .....	157
THE EFFECTS OF PRECEDING CROPS AND THEIR MANAGERMENTS ON SUBSEQUENT POTATO PRODUCTION J. NYIRANEZA, A. MILLS, V. RODD, M.G. GRIMMETT, Y. JIANG.....	159
LEGUME NITROGEN TRANSFER IN GRASS-CLOVER LEYS – A 15-NITROGEN NATURAL ABUNDANCE STUDY IN ORGANIC AND CONVENTIONAL CROPPING SYSTEMS A. OBERSON, A. HAMMELEHLE, J. MAYER, P. MÄDER, E. FROSSARD, A. LÜSCHER.....	161
IMPROVING THE UNDERSTANDING OF NITROGEN PROCESSES BY COMBINING FIELD OBSERVATIONS AND DYNAMIC ECOSYSTEM MODELLING J. OLOFSSON, C. AKSELSSON, G. ZANCHI, S. BELYAZID .....	163

APPLICATION OF SUGAR BY-PRODUCTS AND NUTRIENTS BY FERTIGATION ENHANCES FRUIT TREE GROWTH AND YIELD PRECOCITY M. PASCUAL, J. LORDAN, J.M. VILLAR, J. RUFAT .....	165
CANOPY MANAGEMENT ON RAINFED VINEYARDS FOR OPTIMIZATION OF NITROGEN AND WATER USE AND WINE QUALITY IMPROVEMENT M. PASCUAL, M.P. ROMERO, F. FONSECA, J. PAPIO, J.M. VILLAR, J. RUFAT .....	167
USE OF IMAGE ANALYSIS FOR EVALUATION OF FRUIT TREES GROWTH UNDER DIFFERENT NUTRIENT STRATEGIES: PRELIMINAR RESULTS M. PASCUAL, J.M. VILLAR, J. RUFAT .....	169
NITROGEN TRANSFORMATION DURING ANIMAL WASTE COMPOSTING F.H. BERNARDI, M.S.S.M COSTA, L.A.M. COSTA, H.E.F. LORIN, L.J. CARNEIRO, F.T. SANTOS, V.C. ROZATTI, D.P. LEAL JR, D.C. PEREIRA, M.A.T. ROZATTI .....	171
THE AMOUNT OF MINERAL NITROGEN IN ORGANIC SOILS OF GRASSLANDS IN POLAND S. PIETRZAK .....	173
TECHNOLOGICAL QUALITY OF WINTER WHEAT DEPENDING ON NITROGEN APLICATIONS G. PODOLSKA .....	175
CONTRIBUTION OF DAIRY RATION COMPONENTS TO NITROGEN IN MILK, MANURE, CROPS AND ENVIRONMENTAL NITROGEN LOSS J. POWELL, T. BARROS, M. DANES, M. WATTIAUX .....	177
NITROGEN DYNAMICS IN THE RHIZOSPHERE R. SHAW, A.P. WILLIAMS, D.L. JONES .....	179
GROWTH AND NITROGEN RECOVERY IN THE ABOVE-GROUND BIOMASS OF ELEVEN SELF-RESEEDING ANNUAL LEGUMES GROWN IN A RAINFED OLIVE ORCHARD M. ARROBAS, I.Q. FERREIRA, S. FREITAS, P. DIMANDE, J.M. PIRES, M.A. RODRIGUES .....	181
MONITORING NITROGEN NUTRITIONAL STATUS OF VEGETABLES IN THE SOCIAL GARDEN OF POLYTECHNIC INSTITUTE OF BRAGANÇA, NE PORTUGAL H. LOPES, M. ARROBAS, S. FREITAS, I.Q. FERREIRA, M.A. RODRIGUES .....	183
NITROGEN CONTENT IN ABOVE-GROUND PLANT PARTS AS AN AID TO ESTABLISH MORE ACCURATE FERTILIZER-NITROGEN RECOMMENDATIONS FOR GRAPEVINE M.A. RODRIGUES, I.Q. FERREIRAS, FREITAS, J.L.V. ANDRADE, M. ARROBAS .....	185
PRELIMINARY CRITICAL NITROGEN NUTRITIONAL INDICES FOR LEMON BALM (MELISSA OFFICINALIS) GROWN IN A MEDITERRANEAN ENVIRONMENT IN NORTH- EASTERN PORTUGAL S. FREITAS, M. ARROBAS, I.Q. FERREIRA, M.J. SOUSA, M.A. RODRIGUES .....	187
THE EFFECT OF DIFFERENT WINTER COVER CROPS ON SORGHUM NUTRITIONAL STATUS AND DRY MATTER YIELD I.Q. FERREIRA, C.F. AGUIAR, M. ARROBAS, D. DIAS, S. FREITAS, M.A. RODRIGUES .....	189
TESTING OF A STABILIZED NITROGEN FERTILIZER IN A RICE-WHEAT DOUBLE- CROP ROTATION IN SOUTHEASTERN CHINA M. HOFMEIER, M. ROELCKE, Y. HAN, Z.C. CAI, C. SCHUSTER, M. FUCHS, R. NIEDER .....	191
IMAGE TECHNIQUES TO EVALUATE THE VEGETATIVE GROWTH OF AN OLIVE ORCHARD J. RUFAT, J. PAPIO, V. MONTILLA, A. ARBONES, M. PASCUAL, J.M. VILLAR .....	194
THE IMPACT OF NITROGEN FERTILIZER NORM ON INDICATORS OF NUTRIENT USE FOR SPRING BARLEY A. RUZA .....	196
MAXIMUM NITROGEN RATES APPLICATION AND POSITIVE EFFECT OF THE ROTATION WITH ALFALFA ON THE WHEAT FIELD IN THE NORTHERN ITALY F. SAVI, L. BORRELLI, G. CABASSI .....	198

TEMPORAL DYNAMICS OF NITROGEN RHIZODEPOSITION IN PEAS A. SCHMIDT, F. NAETHER, L. HANS, T. HAASE, C. BRUNS, J. HESS, R.G. JOERGENSEN, F. WICHERN.....	200
PHENOTYPIC AND GENOTYPIC CHARACTERIZATION OF INDIGENOUS RHIZOBIA NODULATING ALFALFA IN MEDITERRANEAN REGION OF CROATIA S. SIKORA, M. BLAZINKOV, S. KAJIC, N. BUREK SVETEC, M. LEKCEVIC.....	202
INITIALIZING THE DSSAT-CENTURY MODEL: INVERSE CALIBRATION OF CARBON POOLS FROM APPARENT SOIL N MINERALIZATION M. SOLDEVILLA, J.L. GABRIEL, J.L. LIZASO, M. QUEMADA .....	204
BREEDING OF OILSEED RAPE FOR SUSTAINABLE AGRICULTURE: CHARACTERIZATION OF A BRASSICA NAPUS DIVERSITY SET FOR NITROGEN USE EFFICIENCY TRAITS. A. STAHL, B. WITTKOP, W. FRIEDT, R. SNOWDON.....	206
EVALUATION OF THE RELATIONSHIP BETWEEN DIFFERENT HYPERSPECTRAL INDICES AND LEAF N IN WHEAT USING MIXED MODEL THEORY A. STELLACCI, B. BASSO, A. CASTRIGNANO*, D. DE BENEDETTO, R. ROSSI, R.M. FERRARA , M. STELLUTI, A. TROCCOLI .....	208
COMPARING NITROGEN FLUXES IN DIFFERENT CROPPING SYSTEMS DEDICATED TO LIGNOCELLULOSIC BIOMASS PRODUCTION L. STRULLU, A. DIDIER, N. BEAUDOIN, B. MARY, F. FERCHAUD.....	210
NITROGEN UPTAKE AND REMOBILIZATION BY FIELD-GROWN ORANGE TREES G.C. ROCCUZZO, F. SCANDELLARI, M. ALLEGRA, B.F. TORRISI, A. G. T. MIMMO, F. INTRIGLIOLO, P. MILLARD, M. TAGLIAVINI.....	212
MODELLING WATER AND N IN LISBON URBAN FARMS S. TEDESCO, M. CAMEIRA, T. LEITÃO .....	214
MANAGING SPATIAL AND TEMPORAL UNCERTAINTIES IN ACTUAL AND FORECAST RAINFALL FOR OPTIMAL IN-SEASON NITROGEN FERTILIZER RATES RECOMMENDATIONS IN CORN N. TREMBLAY, G. BOURGEOIS, R. AUDET, E. FALLON, C. BÉLEC, M.Y. BOUROUBI .....	216
ARE FUNCTIONAL TRAITS RELEVANT TO CHARACTERISE PLANT STRATEGIES OF COVER CROP SPECIES? H. TRIBOUILLOIS, F. FORT, P. CRUZ, R. CHARLES, E. GARNIER, E. JUSTES .....	218
DESIGN OF BISPECIFIC LEGUME/NON-LEGUME COVER CROP MIXTURES TO PRODUCE VARIOUS ECOSYSTEM SERVICES RELATED TO NITROGEN MANAGEMENT H. TRIBOUILLOIS, E. JUSTES, P. CRUZ.....	221
ENHANCED NITROGEN AVAILABILITY HAS AN IMPACT ON EXTRACELLULAR ENZYME ACTIVITY IN THE RHIZOPLANE OF CISTUS LADANIFER BUT NOT IN THE SURROUNDING SOIL F. ULM, C. GOUVEIA, T. DIAS, C. CRUZ.....	224
CLIMATE CHANGE AND NITROGEN FERTILIZATION FOR WINTER DURUM WHEAT AND TOMATO CULTIVATED IN SOUTHERN ITALY D. VENTRELLA, L. GIGLIO, M. CHARFEDDINE.....	226
THE EFFECT OF NEW N FERTILIZERS ON YIELD AND GRAIN NITROGEN IN WINTER WHEAT J. VILLAR, F. FONSECA, P. VILLAR, M. PASCUAL, J. RUFAT, J. LORDAN, V. MONTILLA, J. PAPIÓ, I. CARRASCO.....	229
EFFECTS OF FERTILISER NITROGEN MANAGEMENT ON NITRATE LEACHING RISK FROM GRAZED DAIRY PASTURE IN NEW ZEALAND I. VOGELER, M. SHEPHERD, G. LUCCI .....	231
CROP RESPONSE AND NITROGEN LOSSES AS AFFECTED BY THE REDUCTION OF THE SOIL MINERAL-N TARGET VALUE FOR ORGANIC GREENHOUSE TOMATO W. VOOGT, A. VAN WINKEL, N. ENTHOVEN.....	233
EFFECTS OF POLYACRYLAMIDE AND DICYANDIAMIDE ON CARBON AND NITROGEN MINERALISATION F. WICHERN, Y. SINGH, T. IQBAL, C. WATSON, C. KNOBLAUCH, P.F. SIMON .....	235

ESTIMATION OF BELOW-GROUND NITROGEN IN CATCH CROPS F. WICHERN, M.J. KANDERS, C. BERENDONK, C. FRITZ.....	237
HOW ACCURATELY CAN WE ESTIMATE BELOW-GROUND NITROGEN OF LEGUMES? F. WICHERN.....	239
SOIL CARBON AND FERTILITY AS AFFECTED BY THE SOURCE OF APPLIED NITROGEN UNDER NO-TILLAGE MANAGEMENT IN A VOLCANIC TEMPERATE SOIL E. ZAGAL, P. ETCHEVERRIA, I. VIDAL, C. MUÑOZ, C. CÓRDOVA .....	241
GENE EXPRESSION-BASED DIAGNOSTICS: A NEW WAY TO QUANTIFY PLANT NITROGEN STATUS? B. ZEBARTH, H.H. TAI, S. LUO, X.-Q. LI, D. DE KOEYER.....	243
PREDICTION OF SOIL NITROGEN SUPPLY USING A SIMPLE KINETIC MODEL B. ZEBARTH, J. DESSUREAULT-ROMPRÉ, D.L. BURTON, A. GEORGALLAS .....	245
EFFECTS OF FERTILISATION AND IRRIGATION ON YIELD AND NITROGEN USE EFFICIENCY OF POTATOES Z. ZHOU, M.N. ANDERSEN, F. PLAUBORG.....	247
FLUXES OF MINERAL NITROGEN IN SOILS OF LITHUANIA DURING THE FROST-FREE SEASON L. ZICKIENE, R. STAUGAITIENE, A. MASEVICIENE .....	249
ASSESSMENT OF LEAF N PERCENTAGE FROM COLOR IMAGING: A CONCEPTUAL MODEL A. ZILBERMAN, B. BAR-YOSEF, J. BEN ASHER.....	251

## Topic 2

### Agronomic and environmental impacts of recycling organic residues

THE POTENTIAL OF UNDERSOWN CATCH CROPS AND LEAVING VEGETABLE CROP RESIDUES INTACT IN INTENSIVE VEGETABLE ROTATIONS L. AGNEESSENS, B. VANDECASTEELE, T. VAN DE SANDE, S. CRAPPÉ, J. DE NIES, A. ELSÉN, S. DE NEVE .....	255
THE YIELD FORMATION IN ORGANIC CULTIVATED SPELT BASED ON N SUPPLY WITH ORGANIC FERTILIZERS F. BAVEC, M. SIJARTO, M. JAKOP, M. BAVEC.....	257
NITROGEN RECOVERY FROM LOW-EMISSION APPLIED DAIRY SLURRY BY THREE FORAGE GRASSES: A LONG-TERM TRIAL S. BITTMAN, DE HUNT, J. SCHRODER .....	259
TEMPORAL EVOLUTION OF THE IMPACT OF A WOODY BIOCHAR ON SOIL NITROGEN PROCESSES – A 15N TRACING STUDY V. NELISSEN, T. RÜTTING, D. HUYGENS, G. RUYSSCHAERT, P. BOECKX.....	261
NITROGEN MINERALIZATION UNDER DIFFERENT FERTILIZER AND TILLAGE STRATEGIES A. BOSCH-SERRA, M.R. YAGUUE, B. SAFONT, C. ORTIZ, J. BOIXADERA.....	263
PHYSICOCHEMICAL CHANGES AND NITROGEN LOSSES DURING COMPOSTING OF ACACIA LONGIFOLIA WITH PINE BARK L. BRITO, I. MOURÃO, J. COUTINHO .....	265
NITROGEN LOSSES AND TRANSFORMATIONS DURING STORAGE OF SOLID MANURES OF CONTRASTING N AVAILABILITY V. CAMP, A. JOYNES, T. MISSELBROOK, A. ROLLETT, M. CROOKES, J. WILLIAMS, B. CHAMBERS .....	267
ASSESSING AMMONIA EMISSIONS FROM LIQUID MANURE STORAGE: A MODELLING APPROACH APPLIED TO DANISH AND ITALIAN CONDITIONS F. CANDONI, F. DA BORSO, F. DANUSO, F. GINALDI, S.G. SOMMER .....	269
LOSSES OF NITROGEN DURING THE DECOMPOSITION PROCESS OF ANIMAL MANURE IN STATIC PILES WITHOUT FORCED AERATION F.T. SANTOS, M.S.S.M. COSTA, L.A.M. COSTA, L.J. CARNEIRO, F.H. BERNARDI, H.E.F. LORIN, D.P. LEAL JR, D.C. PEREIRA, M.A.T. ROZATTI, V.C. ROZATTI.....	272

NITROGEN MINERALIZATION DURING CO-ANAEROBIC DIGESTION OF WASTE FROM CATTLE AND SHEEP	
D.P. LEAL JR, M.S.S.M. COSTA, L.A.M. COSTA, F.H. BERNARDI, F.T. SANTOS, H.E.F. LORIN, L.J. CARNEIRO, D.C. PEREIRA, M.A.T. ROZATTI, V.C. ROZATTI	274
NITROGEN MINERALIZATION IN SOLID FRACTION OF CATTLE AND SHEEP LITTER WASTE	
L.J. CARNEIRO, M.S.S.M. COSTA, L.A.M. COSTA, F.T. SANTOS, H.E.F. LORIN, F.H. BERNARDI, M.A.T. ROZATTI, V.C. ROZATTI, D.P. LEAL JR, D.C. PEREIRA	276
BIOCHAR FROM DIFERENT RESIDUES HAVE A DISTINCT IMPACT ON SOIL N DYNAMICS	
I. LÓPEZ-CANO, M.L. CAYUELA, A. ROIG, M.A. SÁNCHEZ-MONEDERO	278
THE FATE OF CROP AVAILABLE NITROGEN FROM CONTRASTING ANAEROBIC DIGESTATE AND PIG SLURRY APPLICATIONS TO ARABLE LAND	
B.J. CHAMBERS M.J. TAYLOR, J.R. WILLIAMS, A.J. ROLLETT, F.A. NICHOLSON AND R.E. THORMAN	281
EXPRESSO COFFEE RESIDUES AS A NITROGEN AMENDMENT FOR SMALL SCALE VEGETABLE PRODUCTION	
C M d S CORDOVI, S F CRUZ	283
IMPACT OF SOIL CHARACTERISTICS ON NITROGEN MINERALIZATION FROM EXOGENOUS ORGANIC MATERIALS IN SOILS	
C M d S CORDOVI, S C SAMPAIO	284
NITROGEN DYNAMICS IN POULTRY LITTER BY SIX SUBSEQUENT LOTS	
A. TEÓFILO ROZATTI, M. SAROLLI S. DE M. COSTA, L.A. DE MENDONÇA COSTA, H.E. FRANCISCONI LORIN, L.J. CARNEIRO, F.H. BERNARDI, F. TORRES DOS SANTOS, V.C. ROZATTI, D.P. LEAL JR., D. CERI PEREIRA	285
NITROGEN MINERALISATION BY VERMICOMPOSTING IN CATTLE MANURE AND SHEEP LITTER	
M. SAROLLI SILVA DE MENDONÇA, L.A. DE MENDONÇA COSTA, F.H. BERNARDI, F. TORRES DOS SANTOS, H.E. FRANCISCONI LORIN, L.J. CARNEIRO, D. CERI PEREIRA, M.A. TEÓFILO ROZATTI, V.C. ROZATTI, D.P. LEAL JR.	287
NITROGEN MINERALIZATION IN BIOLOGICAL PROCESSES OF BEEF CATTLE WASTE STABILIZATION	
H.E. FRANCISCONI LORIN, M. SAROLLI S. DE M. COSTA, L.A. DE MENDONÇA COSTA, F. TORRES DOS SANTOS, L.J. CARNEIRO, F.H. BERNARDI, D.P. LEAL JR., D. CERI PEREIRA, M.A. T. ROZATTI, V.C. ROZATTI	289
USING CARBON: NITROGEN RATIO AS AN INDICATOR OF THE NITROGEN REPLACEMENT VALUE OF ORGANIC RESIDUES	
S. DELIN, L. ENGSTRÖM	291
SOIL RECEIVES, SOIL REPORTS: SOIL BACTERIAL COMMUNITIES AS RAPORTEURS OF INTEGRATED ECOSYSTEM RESPONSES TO INCREASED NITROGEN AVAILABILITY	
T. DIAS, C. GOUVEIA, F. ULM, S. CHAVES, R. TENREIRO, M. MARTINS-LOUÇÃO, C. CRUZ	293
MAXIMIZE THE PLANT NITROGEN USE EFFICIENCY OF ANIMAL SLURRY USING AN EFFICIENT TREATMENT PRIOR SOIL APPLICATION	
D. FANGUEIRO, S. SURGY, J. COUTINHO, F. CABRAL, E. VASCONCELOS, J. CARNEIRO	295
EFFECT OF LIMING AND ORGANIC FERTILISATION ON SOIL CARBON SEQUESTERED IN A SILVOPASTORAL SYSTEM UNDER <i>PINUS RADIATA</i> D. DON	
N. FERREIRO-DOMÍNGUEZ, A. RIGUEIRO-RODRÍGUEZ, M.R. MOSQUERA-LOSADA	297
AMMONIA AND ODOUR EMISSIONS FOLLOWING DIGESTATE AND UREA FERTILISATION IN MAIZE	
C. RIVA, M. CAROZZI, M. FUMAGALLI, M. SANNA, S. LONATI, V. ORZI, A. GIUSSANI, A. PEREGO, M.E. CHIODINI, L. ALFIERI, F. ADANI, M. ACUTIS	299
INTERACTIONS BETWEEN FREE-LIVING NEMATODES AND MICROBES IN ORGANICALLY AMENDED SOILS: EFFECTS ON N MINERALIZATION	
M. GEBREMIKAEL, D. BUCHAN, S. DE NEVE	301
STABILIZATION AND LOSSES OF N IN SOIL AMENDED WITH 15N-LABELED RESIDUES COMBINED WITH AN ORGANIC N FERTILIZER	
P. GIOACCHINI, D. MONTECCHIO, V. TERZI, M. STANCA, C. CIAVATTA, C. MARZADORI	303
EFFECT OF DRYING TEMPERATURE ON NITROGEN MINERALISATION AND SOIL N <sub>2</sub> O EMISSIONS FOLLOWING ADDITION OF THERMALLY-DRIED SLUDGES	
S. D. C. CASE, B. GÓMEZ-MUÑOZ, L. S. JENSEN	305



THE SENSITIVITY OF AMMONIA OXIDATION TO SOIL AMMONIUM CONCENTRATION AS AN INDICATOR OF ECOSYSTEM N SATURATION C. GOUVEIA, C. CRUZ, S. CHAVES, T. DIAS, M. CAROLINO .....	307
BIOCHEMICAL VARIATIONS IN PLANT RESIDUES (OILSEED RAPE AND BARLEY STRAW) AFFECT N <sub>2</sub> O EMISSIONS AND ORGANIC MATTER DECOMPOSITION RATE S. KÖBKE, M. SENBAYRAM, K. DITTERT .....	309
NITROUS OXIDE EMISSIONS FROM AN ORGANIC CROPPING SYSTEM AS AFFECTED BY LEGUME-BASED CATCH CROPS X. LI, S. O. PETERSEN, P. SØRENSEN, J. E. OLESEN .....	311
DISTRIBUTION OF NITROGEN, PHOSPHORUS, POTASSIUM AND CARBON BETWEEN MANURES IN FUNCTION OF BARN CATEGORIES M. MATHOT, D. STILMANT, S. HENNART, M. DE TOFFOLI, R. LAMBERT .....	313
HISTORICAL DEVELOPMENT OF AMMONIA EMISSIONS AND NITROGEN FLOWS RELATED TO SWISS AGRICULTURE H. MENZI, M. KLOSSNER, T. KUPPER, B. ACHERMANN .....	315
UNDERSTANDING EMERGING MECHANISMS THAT UNDERPIN NITROGEN MINERALISATION AND THEIR IMPACT ON NITROGEN MANAGEMENT STRATEGIES C. MURPHY, E. PATERSON, E. BAGGS, N. MORLEY, D. WALL, R. SCHULTE .....	317
NITROGEN DYNAMICS IN SOILS OF CENTRAL AFRICAN SMALLHOLDER FARMS R. NIEDER, C. KNOBLAUCH, F.X. NARAMABUYE, A. NDOLI .....	319
ABATEMENT MEASURES OF AMMONIA EMISSIONS IN THE MANURE MANAGEMENT CHAIN – A QUANTITATIVE ANALYSIS Y HOU ; G.L. VELTHOF ; O OENEMA .....	321
N MINERALIZATION FROM GREEN MANURES IN A LABORATORY INCUBATION STUDY A. PERDIGÃO, N. MOREIRA, H. TRINDADE, J. COUTINHO .....	323
MINERALISATION NITROGEN DURING ANAEROBIC CO-BIODIGESTION FROM LIQUID FRACTION OF WASTE FROM CATTLE AND SHEEP V.C. ROZATTI, M.S.S.M COSTA, L.A.M. COSTA, L.J. CARNEIRO, F.H. BERNARDI, F.T. SANTOS, H.E.F. LORIN, D.P. LEAL JR, D.C. PEREIRA, M.A.T. ROZATTI .....	325
MINERALIZATION OF ORGANIC FERTILIZERS PACKED IN POROUS CAPSULES DURING AUTUMN-WINTER SEASONS D. PEREIRA , M.S.S.M COSTA , L.A.M. COSTA , F.T. SANTOS , H.E.F. LORIN , L.J. CARNEIRO , F.H. BERNARDI , M.A.T. ROZATTI , V.C. ROZATTI , D.P. LEAL JR .....	327
NITROGEN DYNAMICS IN TWO SOILS WITH DIFFERENT TEXTURE TREATED WITH LIVESTOCK-DERIVED ORGANIC MATERIALS G. GIGLIOTTI, D. PEZZOLLA, L. MASSACCESI, A. AGNELLI .....	329
INTERACTIONS BETWEEN THE CHEMICAL QUALITY OF CROP RESIDUES AND THEIR LOCATION IN SOIL: HOW NITROGEN AVAILABILITY CONTROLS MINERALIZATION OF C AND N? M. REDIN, S. RECOUS, G. DIETRICH, A.C. SKOLAUDE, B. CHAVES, I.C. PFEIFER, C. AITA, S.J. GIACOMINI .....	332
NITROGEN MINERALIZATION FROM A SOIL AMENDED WITH SEAWEED AND FISH WASTE COMPOST M. ILLERA-VIVES, S. LÓPEZ-RODRÍGUEZ, M.E. LÓPEZ-MOSQUERA, H. RIBEIRO .....	334
NITROUS OXIDE EMISSION FACTORS FOR DAIRY COW EXCRETA IN EASTERN CANADA P. ROCHETTE, M.H. CHANTIGNY, N. ZIADI, D.A. ANGERS, G. BELANGER, E. CHARBONNEAU, D. PELLERIN, C. LIANG, N. BERTRAND .....	337
FIELD EVALUATION OF THE IMPACT OF BIOCHAR AND COMPOST AMENDMENTS ON NITROUS OXIDE EMISSIONS FROM SOIL M. SÁNCHEZ-GARCÍA, A. ROIG, M.A. SÁNCHEZ-MONEDERO, M.L. CAYUELA .....	339

IMPACTS OF LONG-TERM COMPOST APPLICATION ON SELECTED INDICATORS FOR SOIL ORGANIC MATTER DYNAMICS	
H. SPIEGEL, G. DERSCH, J. SÖLLINGER, K. AICHBERGER, N. SCHLATTER, A. BAUMGARTEN .....	341
SHORT-TERM CARBON DIOXIDE AND NITROUS OXIDE EMISSIONS AND CHANGES IN PHYSICO-CHEMICAL PROPERTIES FROM SOILS AMENDED WITH DIFFERENT BIOCHARS	
R. SUBEDI, N. TAUPE, J.J. LEAHY, S. PELISSETTI, L. PETRUZZELLI, C. BERTORA, C. GRIGNANI .....	343
NITROGEN ISOTOPIC COMPOSITION OF N-SOURCES, VEGETABLES AND SOIL FROM TWO ORGANIC FARMING SYSTEMS	
C.T. INÁCIO, S. URQUIAGA, P.M. CHALK, M.G.F. MATA, P.O. SOUZA .....	345
PART OF GRASSLAND IN LEY-ARABLE ROTATIONS IS A PROXY FOR PREDICTING LONG- TERM SOIL ORGANIC MATTER DYNAMICS	
F. VERTES, B. MARY .....	347
COMPARISON OF MICROMETEOROLOGICAL TECHNIQUES FOR ESTIMATING AMMONIA EMISSION FROM COVERED SLURRY STORAGE AND LANDSPREADING OF CATTLE SLURRY	
M. VIGURIA, A. SANZ-COBENÑA, O. ALBERDI, D.M. LÓPEZ, H. ARRIAGA, A. VALLEJO, PILAR MERINO .....	349
DEVELOPMENT OF A MODELLING FRAMEWORK OF NITROUS OXIDE FOR BIOGAS DIGESTATE USED AS FERTILISER	
J. WANG .....	351
NITROGEN DYNAMICS IN AN UPLAND RICE-STYLOSANTHES GUIANENSIS BASED CONSERVATION AGRICULTURE SYSTEM IN THE MIDWEST HIGHLANDS OF MADAGASCAR	
O. ZEMEK, E. FROSSARD, L. RANDRIAMANANTSOA, L. RABEHARISOA, E. SCOPEL, J.M. DOUZET, J. RAKOTOARISOA, A. OBERSON .....	353
SUSTAINABILITY OF PRODUCTS FROM MANURE	
K. ZWART, R. POSTMA, R. SCHILS .....	355

### Topic 3

#### Controlling reactive nitrogen losses

A DECISION SUPPORT SYSTEM FOR ENVIRONMENTAL STRATEGIES: EFFECT IN FARM N BALANCE	
M. AGUILAR, H. ARRIAGA, P. DUPARD, S. LALOR, R. FRAGOSO, O. PAHL, A. ABAIGAR, L. CORDOVÍN, M. BOYLE, G. LANIGAN, L. LOYON, P. MERINO .....	359
MODELLING MITIGATION OF AUSTRIAN NITROGEN EMISSIONS: ECOLOGICAL AND ECONOMIC CONSIDERATIONS	
B. AMON, S. ZECHMEISTER-BOLTENSTERN, M. KASPER, E. SIGMUND, W. WINIWARTER, A. SCHRÖCK, A. BAUMGARTEN, G. DERSCH, J. KANTELHARDT, L. SCHALLER, T. MOSER, B. KITZLER .....	361
NITROGEN GAS EMISSIONS AND BALANCES OF ENERGY MAIZE CULTIVATED WITH BIOGAS RESIDUE FERTILIZER	
M. ANDRES, U. HAGEMANN, J. AUGUSTIN .....	363
BATFARM SOFTWARE: A SUPPORT TOOL TO MITIGATE NITROGEN LOSSES AT DAIRY HOUSING	
H. ARRIAGA, M. AGUILAR, A. ABAIGAR, L. CORDOVÍN, P. MERINO .....	366
DM YIELD AND N <sub>2</sub> O EMISSIONS AS AFFECTED BY 3,4-DIMETHYLPHIRAZOLPHOSPHATE, A NITRIFICATION INHIBITOR APPLIED DURING WINTER IN NORTHWESTERN SPAIN	
M. BÁEZ BERNAL, C. GILSANZ, M.I. GARCÍA, J. CASTRO .....	368
MITIGATION OF NITROUS OXIDE FOLLOWING GRASSLANDS CULTIVATION	
K. BARAL, J. ERIKSEN, S. O. PETERSEN .....	370

SHORT AND MEDIUM TERM EFFECTS ON NITROGEN LEACHING OF THE INTRODUCTION OF A PEA OR AN OILSEED RAPE CROP IN WHEAT-BASED SUCCESSIONS	
D. BELLOUIN, A. SCHNEIDER, B. CARROUEE, L. CHAMPOLIVIER, C. LE GALL, M.H. JEUFFROY .....	372
NITROUS OXIDE EMISSIONS FROM FERTILISED UK ARABLE SOILS: QUANTIFICATION AND MITIGATION	
M. BELL, N. WINNING, J. CLOY, B. REES, L. CARDENAS, N. DONOVAN, T. SCOTT, C. WEBSTER, A. WHITMORE, J. WILLIAMS, H. BALSHAW, F. PAINE, D. CHADWICK.....	375
NITROGEN LEACHING FROM ORGANIC AGRICULTURE AND CONVENTIONAL CROP ROTATIONS	
M. BENOIT, J. GARNIER, G. BILLEN, B. MERCIER, A. AZOUGUI.....	377
TRENDS IN AGRICULTURAL AMMONIA EMISSION IN CANADA AND POSSIBILITIES FOR MITIGATION	
S. BITTMAN, S.C. SHEPPARD, D.E. HUNT.....	379
A DYNAMIC SIMULATION MODEL TO ANALYSE N <sub>2</sub> O EMISSIONS FROM BIOMETHANE PRODUCTION SYSTEMS	
U. BÖTTCHER, A. KNISS, H. KAGE.....	381
HOW DO DIFFERENT N SOURCES AFFECT N <sub>2</sub> O EMISSIONS FROM SOIL?	
M.E. CALLEJA-CERVANTES, S. MENEDEZ, P.W. HILL, D.L. JONES.....	383
DENITRIFICATION RATE UNDER POTATO PRODUCTION: EFFECT OF THREE NITROGEN FERTILIZER SOURCES IN EASTERN CANADA	
A. CAMBOURIS, I. PERRON, B. ZEBARTH, P. ROCHETTE.....	385
IMPACT OF A NITRIFICATION INHIBITOR DICYANDIAMIDE (DCD) ON N <sub>2</sub> O EMISSIONS FROM URINE APPLIED TO UK GRASSLAND	
L. CARDENAS, V. CAMP, N. DONOVAN, C. HODGSON, T. MISSELBROOK, K. MCGEOUGH, G. MCNEILL, R. LAUGHLIN, C. WATSON, M. BELL, R. REES, D. CHADWICK .....	387
EFFECTS OF PERI-URBAN NH <sub>3</sub> EMISSIONS ON THE CONCENTRATION OF ATMOSPHERIC PARTICULATE MATTER IN THE CITY OF MILAN (ITALY): A PRELIMINARY STUDY.	
M. CAROZZI, M. BEDOGNI, C. DIPIETRO, M. FUMAGALLI, M. SANNA, M. ACUTIS, B. VILLAVECCHIA, S. BRENNIA .....	389
DO HIGH NAPHTHALENE CONCENTRATIONS IN BIOCHAR JUSTIFY THE REDUCTION IN SOIL NITROUS OXIDE EMISSIONS?	
J.A. ALBURQUERQUE, M.A. SÁNCHEZ-MONEDERO, A. ROIG, M.L. CAYUELA.....	392
QUANTIFICATION OF NITROGEN LEACHING TO SHALLOW WATER TABLE IN LARGE SCALE IRRIGATION SCHEMES: A CASE STUDY IN THE MEDITERRANEAN LANDSCAPES	
M. CETIN, H. IBRIKCI, Y. KARAOMERLIOGLU, H. SAGIR.....	394
OVERWINTER TRANSFORMATIONS AND FATE OF FALL-APPLIED NITROGEN AS A FUNCTION OF SOIL CONDITIONS – A MULTI-ECOZONE EXPERIMENT	
M. CHANTIGNY, F. LARNEY, S. BITTMAN, D. LAPEN, D. ANGERS, P. ROCHETTE, D. HUNT .....	396
N <sub>2</sub> O LOSSES IN SOIL WITH SHALLOW GROUNDWATER: EFFECT DUE TO DEROGATION OF NITRATES DIRECTIVE. A CASE STUDY IN VENETO	
E. COCCO, A. BERTI, C. BERTORA, G. DELLE VEDOVE, C. GRIGNANI, B. LAZZARO, R. POLESE, F. MORARI .....	398
LEGUMINOUS COVER-CROPS EFFECTS COMPARED TO NON-LEGUMINOUS ON NITRATE LEACHING AND NITROGEN SUPPLYING TO THE SUCCEEDING CORN AND SPRING BARLEY	
J. COHAN, A. BOUTHIER, J. LABREUCHE, E. JUSTES .....	400
EFFECTS OF ORGANIC MATTER INPUT ON NITRATE LEACHING AND CROP YIELD IN ARABLE AND VEGETABLE CROPPING ON SANDY SOIL IN THE NETHERLANDS	
J. DE HAAN, H. VERSTEGEN .....	402

SIMULATION OF NITROGEN DYNAMICS FOLLOWING WINTER CEREALS UNDER FERTILIZED AND NON-FERTILIZED CATCH CROPS AND BARE FALLOWS	
J. DE WAELE, B. VANDECASTEELE, A. DE VLEGHER, S. DE NEVE	404
DIGESTION AND ACIDIFICATION OF CATTLE SLURRY TO IMPROVE N EFFICIENCY IN GRASS PRODUCTION	
S. DELIN, K. GUSTAFSSON	407
MITIGATION OF NITRATE LEACHING AND NITROUS OXIDE EMISSIONS FROM WINTER FORAGE GRAZING SYSTEMS	
H. DI, K. CAMERON, A. PODOLYAN, B. BALL, J. HE	409
ESCAPADE TO QUANTIFY NITROGEN LOSSES IN TERRITORIES AND ASSESS MITIGATION STRATEGIES	
J. DROUET, F. LAURENT, P. DURAND, G. BILLEN, P. CELLIER, O. MAURY, S. POTOK, P. FAVERDIN, C. FLECHARD, J. GARNIER, A. GUY, C. HENAUT, C. MIGNOLET, H. MONOD, A. PROBST, S. SORIN, G. TALLEC	411
MODEL PREDICTIONS OF STREAMWATER NITRATE CONCENTRATIONS UNDER AGRICULTURE CHANGES: HOW GOOD ARE THEY?	
P. DURAND, F. FERCHAUD, P. MOREAU, T. RAIMBAULT, A. PERES-ESCOBAR, P. BAUDHUIN, C. GIBON, J. SALMON-MONVIOLE	413
HIGH FERTIGATION FREQUENCY DECREASES POTENTIAL NITROGEN LEACHING IN PROCESSING TOMATO GROWN WITH HIGH NITROGEN AND WATER SUPPLY	
M. FARNESELLI, P. BENINCASA, G. TOSTI, M. GUIDUCCI, F. TEL	415
PERMEABLE REACTIVE INTERCEPTORS – BLOCKING DIFFUSE NUTRIENT AND GREENHOUSE GASES LOSSES IN KEY AREAS OF THE FARMING LANDSCAPE	
O. FENTON, M.G HEALY, F. BRENNAN, M.M.R JAHANGIR, G.J. LANIGAN, K.G. RICHARDS, S.F. THORNTON, T.G. IBRAHIM	417
AMMONIUM AND NITRATE IN SURFACE AND GROUND WATERS IN AN AGRICULTURAL AREA IN NW SPAIN	
M. FERNANDEZ-MARCOS, C. LOPEZ MATEO, S. ALVAREZ POUSA, L. GARCIA CALVO	419
AMMONIA EMISSION FROM UREA SPREADING AND RELATIONSHIPS WITH METEOROLOGICAL VARIABLES	
R. FERRARA, M. CAROZZI, B. LOUBET, M. ACUTIS, G. RANA	421
MANAGING THE SOIL NITRATE POOL IN INTENSIVE GRASSLAND AND ARABLE SYSTEMS	
P. FORRESTAL, L. ROCHE, M. HARTY, G. LANIGAN, D. KROL, D. RICHARDS, D. WALL	423
INFLUENCE OF TILLAGE AND LIMING ON N <sub>2</sub> O EMISSION FROM A RAINFED CROP	
S. GARCÍA-MARCO, D. ABALOS, I. MARISCAL-SANCHO, R. ESPEJO, A. VALLEJO	425
RECONNECTING CROP FARMING AND CATTLE BREEDING FOR A REDUCTION OF NITROGEN LOSSES IN AN INTENSIVE AGRICULTURAL WATERSHED	
J. GARNIER, A. ANGLADE, M. BENOIT, G. BILLEN, P. PASSY, M. SILVESTRE, G. TALLEC, L. LASALETTE	427
EFFECT OF A NOVEL NITRIFICATION INHIBITOR ON THE N <sub>2</sub> O EMISSION FROM A SOIL CROPPED WITH WINTER WHEAT	
I. GUZMAN-BUSTAMANTE, R. SCHULZ, T. MÜLLER, R. HÄHNDEL, R. RUSER	429
PRECISE PREDICTION OF AMMONIA EMISSION FROM MANURE: INCLUSION OF PH CHANGES AS AFFECTED BY EMISSION OF AMMONIA AND CARBON DIOXIDE	
S. HAFNER, V. PETERSEN, R. MARKFOGED, S. SOMMER	431
REASSESSMENT OF SWISS AMMONIA EMISSION FACTORS AFTER SLURRY APPLICATION	
C. HÄNI, J. SINTERMANN, M. JOCHER, A. NEFTEL, T. KUPPER	433
NITROUS OXIDE EMISSIONS FROM GRASSLAND AS IMPACTED BY FERTILISER NITROGEN FORMULATION	
M.A. HARTY, P.J. FORRESTAL, D. KROL, J.B. MURPHY, G.J. LANIGAN, G. MCNEILL, K.L. MCGEOUGH, R.J. LAUGHLIN, C.J. WATSON, K.G. RICHARDS	435

MECHANISMS OF INORGANIC NITROUS OXIDE PRODUCTION IN SOILS DURING NITRIFICATION AND THEIR DEPENDENCE ON SOIL PROPERTIES	
J. HEIL, S. LIU, H. VEREECKEN, N. BRÜGGEMANN	437
NITRATE LEACHING FLUX IN DEEP VADOSE ZONE IN WHEAT-CORN DOUBLE CROPPING SYSTEMS IN NORTH CHINA PLAIN	
C. HU, X.X. LI, Z.Q. JU	439
THE NEW NITRIFICATION INHIBITOR DIMETHYLPYRAZOLE-SUCCINIC ACID (DMPSA) REDUCES N <sub>2</sub> O EMISSIONS FROM WHEAT UNDER HUMID MEDITERRANEAN CONDITIONS	
X. HUÉRFANO, R. HÄHNDEL, I. CARRASCO, C. GONZÁLEZ-MURUA, J.M. ESTAVILLO, S. MENÉNDEZ	441
EFFECT OF CROP MANAGEMENT AND CHANGES IN CLIMATIC FACTORS ON NITRATE LEACHING FROM A LONG TERM ORGANIC CEREAL CROPPING SYSTEMS IN DENMARK	
M. JABLOUN, K. SCHELDE, F. TAO, J.E. OLESEN	443
REDUCING NITROGEN LOSSES IN CHINESE CROP SYSTEMS	
X. JU, B. GAO	445
MODELLING OF AMMONIA VOLATILISATION IN FLOODED RICE FIELDS: THE MODIFIED JAYAWEERA-MIKKELSEN MODEL	
N. KHAIRUDIN, M.P. ZAKARIA, P.C. STRUIK, K.J. KEESMAN	447
MODEL BASED ANALYSIS OF FACTORS GOVERNING N <sub>2</sub> O EMISSION FROM BIOENERGY CROPPING SYSTEMS	
A. KNISS, U. BÖTTCHER, M. SENBAYRAM, K. DITTERT, H. KAGE	449
NEW STRATEGIES FOR NITROUS OXIDE MITIGATION AFTER GRASSLAND CULTIVATION	
X. KONG, J. ERIKSEN, S.O. PETERSEN	451
AMMONIA LOSS RATES FROM UREA AND CALCIUM AMMONIUM NITRATE APPLIED TO WINTER WHEAT ON THREE DIFFERENT SITES IN GERMANY	
T. KREUTER, K. NI, M. GABNER, U. SCHMIDHALTER, J. DÖHLER, A. PACHOLSKI	453
POTENTIAL OF HIPPURIC ACID AND BENZOIC ACID TO MITIGATE NITROUS OXIDE EMISSIONS FROM URINE PATCHES	
D. KROL, P.J. FORRESTAL, G.J. LANIGAN, K.G. RICHARDS	456
NITROUS OXIDE EMISSIONS ASSOCIATED WITH LAND-USE CHANGE OF GRASSLAND TO ENERGY CROP PRODUCTION	
D. KROL, M. WILLIAMS, M. B. JONES, G. LANIGAN	458
QUANTIFYING THE EFFECTS OF DISSOLVED ORGANIC MATTER CARBON ON DENITRIFICATION	
M. KUNTZ, N. MORLEY, P. HALLETT, C. WATSON, K. BLACK, E. BAGGS	459
SOIL NITROGEN IN SHRUB ENCROACHED MEDITERRANEAN OAK ECOSYSTEMS: EFFECT AFTER SHRUB CLEAR-CUT	
X. LECOMTE, A. HORTA, D. FANGUEIRO, M.C. CALDEIRA	461
SALT AS A DIURETIC FOR DECREASING NITROGEN LEACHING LOSSES FROM GRAZED PASTURES	
S. LEDGARD, B. WELTEN, K. BETTERIDGE	463
EFFECT OF NITROGEN SOURCE ON NITRIC OXIDE AND NITROUS OXIDE EMISSIONS FROM A UK GRASSLAND SOIL	
N. LOICK, L. DIXON, R. WELL, P. MATTHEWS, L. CARDENAS	465
STUDY OF NITROUS OXIDE (N <sub>2</sub> O) LOSSES IN A DRIP IRRIGATED PEACH CROP SYSTEM	
J. LORDAN, F. FONSECA, J. PAPIÓ, V. MONTILLA, J.M. VILLAR, M. PASCUAL, J. RUFAT	468
TEMPORAL AND SPATIAL VARIATION OF N <sub>2</sub> O FLUXES FROM MANAGED PRE-ALPINE GRASSLAND	
H. LU, J. FU, R. GASCHÉ, M. DANNENMANN, K. BUTTERBACH-BAHL, R. KIESE	470

EFFECT OF IRRIGATION AND FERTILIZER ON N <sub>2</sub> O EMISSIONS FROM PADDY SOIL DURING THE SEEDLING STAGE IN NE SPAIN	
S. MARIS, M.R. TEIRA ESMATGES, A.D. BOSCH SERRA, D. QUILEZ, M.M. CATALA FORNER.....	472
USING 1H NMR PROFILING TO IDENTIFY SOIL METABOLITES RELATED TO NITROGEN MINERALISATION	
N.T. McDONALD, S.F. GRAHAM, C.J. WATSON, A. GORDON, R.J. LAUGHLIN, S.T.J. LALOR, C.T. ELLIOTT, D.P. WALL .....	475
COMPARISON OF AN AUTOMATED GAS SAMPLING SYSTEM (AGPS), WITH A STATIC CHAMBER METHOD FOR MEASUREMENT OF N <sub>2</sub> O EMISSIONS FROM A PERMANANT GRASSLAD SITE	
G. MCNEILL, B. MCCARNEY, K. MCGEOUGH, R. LAUGHLIN, C. WATSON.....	477
SUBSTRATE INDUCED DENITRIFICATION OVER OR UNDER ESTIMATES SHIFTS IN SOIL DI-NITROGEN/NITROUS OXIDE RATIOS	
N. MORLEY, D. RICHARDSON, E. BAGGS.....	479
ESTIMATES OF GREENHOUSE GASES EMISSIONS FROM THE USE OF SEWAGE SLUDGE AS FERTILIZER IN AGRICULTURAL SYSTEMS	
E. FERNÁNDEZ-NUÑEZ, A. RIGUEIRO-RODRÍGUEZ, M.R. MOSQUERA-LOSADA .....	481
N <sub>2</sub> O EMISSIONS FROM CROPPING SYSTEMS WITH INTEGRATED WEED MANAGEMENT	
A. VERMUE, C. HÉNAULT, A. COFFIN, N. MUNIER-JOLAIN, B. NICOLARDOT.....	483
THE CONTRIBUTION OF CROP RESIDUES TO NITROUS OXIDE EMISSIONS FROM ARABLE CROPS	
V. PAPPA, R.E. THORMAN, G. BENNETT, S. MALKIN, H. KINGSTON, K.E. SMITH, R. SYLVESTER-BRADLEY, R.M. REES .....	485
NITROUS OXIDE INTENSITIES OF LEGUME BASED AGRICULTURAL SYSTEMS IN EUROPE	
V. PAPPA, A. PRISTERI, D. SAVVAS, M. YOUNG, B. BALL, R.J. LÓPEZ-BELLIDO, I. TONCEA, C.K. KONTOPOULOU, M. WILLIAMS, P. IANETTA, M. MONTI, R.M. REES .....	487
LOWLAND SPRINGS: MODEL ESTIMATION OF NITROGEN LEACHING UNDER CURRENT AND FUTURE CLIMATE SCENARIOS IN A CASE STUDY IN NORTHERN ITALY	
A. PEREGO, A. GIUSSANI, M. SANNA, M. FUMAGALLI, M. CAROZZI, M. CHIODINI, L. ALFIERI, M. BALDERACCHI, M. TREVISAN, M. ACUTIS .....	489
NITROUS OXIDE ANALYSIS BY LASER SPECTROSCOPY: NEW APPLICATIONS	
S. PETERSEN, K. BARAL .....	491
SIMULATION OF NITROUS OXIDE EMISSIONS USING THE APSIM PLATFORM: AN EXPLORATORY STUDY ABOUT DENITRIFICATION'S CONSTANT FOR A BRAZILIAN SUGAR CANE SOIL	
P. PRADO, P. J. THORBURN, J. B. CARMO.....	493
POTENTIAL EMISSIONS OF NITROUS OXIDE FROM VINEYARD SOIL: SIMULATION OF RAIN AND FERTILIZATION EVENTS UNDER CONTROLLED CONDITIONS	
C. GAUDNICK, S. RECOUS, L. JOLY, G. ALA VOINE, A. CANTAREL, N. DUMELIE, T. DECARPENTERIE, C. GEORGET .....	495
REDUCING NITROUS OXIDE EMISSIONS FROM SPRING BARLEY IN IRELAND	
L. ROCHE, K.G. RICHARDS, P.J. FORRESTAL, G.J. LANIGAN, L.J. SHAW, M.J. GOODING, R. HACKETT, D.P. WALL .....	497
NITROGEN MINERALIZED DURING SORGHUM GROWTH AFTER SOIL INCORPORATION OF DIFFERENT WINTER COVER CROPS	
D. DIAS, C.F. AGUIAR, M. ARROBAS, M.A. RODRIGUES .....	500
THE NH <sub>3</sub> -ABATING EFFECT OF SLURRY INJECTION AS INFLUENCED BY SOIL MOISTURE IN A SEMIARID ARABLE SOIL	
A. SANZ COBENA, T. MISSELBROOK, A. ARCE, A. VALLEJO.....	502

N <sub>2</sub> O REDUCTION POTENTIAL OF 3,4-DIMETHYL-PYRAZOLE PHOSPHATE (DMPP) IN DIGESTATE INJECTION	
M. SEVERIN, R. FUß, R. WELL, R. HÄHNDEL, F. GARLIPP, H. VAN DEN WEGHE .....	504
AN EMPIRICAL APPROACH TO ESTIMATE THE EFFECTIVENESS OF DICYANDIAMIDE IN DECREASING NITRATE LEACHING FROM GRAZED PASTURE IN NEW ZEALAND	
M. SHEPHERD, D. WHEELER, R. SMITH.....	506
COMPARISON OF TWO DAIRY GRAZING SYSTEMS IN THE WAIKATO REGION OF NEW ZEALAND: EARLY RESULTS ON NITRATE LEACHING	
M. SHEPHERD, P. PHILLIPS, G. LUCI, K. MACDONALD, C. GLASSEY, C. ROACH, S. WOODWARD, W. GRIFFITHS .....	508
INFLUENCE OF ANTHROPOGENIC LOADING ON NITROGEN LEACHING IN FLUVISOLS	
T. SIMEONOVA, L. NENOVA, D. STOICHEVA .....	510
ARTIFICIAL AMMONIA RELEASE AND LAGRANGIAN DISPERSION MODELLING	
J. SINTERMANN, C. HÄNI, M. JOCHER, A. NEFTEL .....	512
LINEAR AND NON-LINEAR RESPONSES OF NITROUS OXIDE EMISSIONS TO FERTILISER NITROGEN RATE AND THEIR IMPACT ON EMISSION INTENSITIES OF ARABLE CROPS	
K. SMITH, K.E. THORMAN, M. CHAUHAN, G. BENNETT, S. MALKIN, D.G. MUNRO, V.A. PAPP, R.M. REES, R. SYLVESTER-BRADLEY .....	514
EFFECT OF PIG SLURRY ACIDIFICATION AND FORM SOIL APPLICATION IN N APPARENT LEACHING UNDER FIELD CONDITIONS	
J.R. SOUSA, J. CARNEIRO, D. FANGUEIRO, J. COUTINHO.....	516
NITROUS OXIDE EMISSIONS FROM CLOVER RICH LEYS DURING THE LONG NORTHERN WINTER	
I. STURITE, S. RIVEDAL, P. DÖRSCH .....	517
EFFECT OF A NITRIFICATION INHIBITOR ON N <sub>2</sub> O EMISSIONS AFTER MINERAL FERTILIZER APPLICATION ON A SANDY LOAM SOIL	
E. THIEL, T. KREUTER, C. SCHUSTER .....	519
NITRIFICATION INHIBITOR AND NITROGEN FERTILISER APPLICATION TIMING STRATEGIES TO REDUCE NITROUS OXIDE EMISSIONS FROM WINTER WHEAT LAND	
R.E. THORMAN, J.R. WILLIAMS, T.H. MISSELBROOK, A.J. ROLLETT, A. BOWDEN, A. SHROSBREE AND B.J. CHAMBERS.....	521
REDUCING EXTERNAL NITROGEN COSTS OF PIG PRODUCTION IN THE EUROPEAN UNION BY SPATIAL RELOCATION	
J. VAN DAM, J. VAN GRINSVEN, M. TIMMERS, S. VAN DER SLUIS, G. VELTHOF .....	524
IMPACTS OF LAND-BASED NUTRIENT LOSSES TO THE MARINE ECOSYSTEM	
M. VOSS, B. GRIZZETTI, W. WINIWARTER.....	526
N MINERALISATION, DENITRIFICATION AND N <sub>2</sub> O FLUXES IN A HISTIC GLEYSOL FOLLOWING DIFFERENT GRASSLAND RENOVATION TECHNIQUES IN NORTHWEST GERMANY	
R. WELL, C. BUCHEN, W. ESCHENBACH, D. LEWICKA-SZCZEBAK, M. HELFRICH, A. GENSIO, H. FLESSA .....	528
BANDSPREAD SLURRY APPLICATIONS TO GRASSLAND: EFFECTS ON THE BALANCE OF AMMONIA AND NITROUS OXIDE EMISSIONS TO AIR AND SLURRY NITROGEN USE EFFICIENCY	
J.R. WILLIAMS, L. SAGOO, R.E. THORMAN, B.J. CHAMBERS, T.H. MISSELBROOK AND D.R. CHADWICK .....	530
MODELLING N <sub>2</sub> O EMISSIONS FROM AUSTRIAN SOILS: IMPACT OF SOIL TYPE, CROP MANAGEMENT AND CLIMATE	
S. ZECHMEISTER-BOLTENSTERN, E. SIGMUND, M. KASPER, B. KITZLER, E. HAAS, M. WANDL, P. STRAUSS, E. POETZELSBERGER, G. DERSCH, W. WINIWARTER, B. AMON .....	533

AGRONOMIC ASSESSMENT OF NITRATE LEACHING AND GREENHOUSE GASES EMISSIONS IN WHEAT AND MAIZE SYSTEMS	
M. ZHOU, K. BUTTERBACH-BAHL, B. ZHU .....	535

#### Topic 4

##### Food security, integrative and global nitrogen challenges

FEEDING THE WORLD IN 2050: ASSESSING THE REALM OF POSSIBILITIES	
G. BILLEN, L. LASSALETTA, J. GARNIER.....	539
STUCK IN THE ANTHROPOCENE: THE CASE OF REACTIVE NITROGEN	
B. BODIRSKY, A. POPP, H. LOTZE-CAMPEN, J.P. DIETRICH, S. ROLINSKI, I. WEINDL, C. SCHMITZ, C. MÜLLER, M. BONDSCH, F. HUMPEODER, A. BIEWALD, M. STEVANOVIC .....	541
A FIRST APPROACH TO THE CALCULATION OF N-FOOTPRINT IN PORTUGAL	
C.M.d.S. CORDOVIL, V. GONÇALVES, A., LEACH A.M., GALLOWAY J.N., de VARENNES A. ....	543
THE RELATIONSHIP BETWEEN CROP YIELD AND NITROGEN INPUT TO CROPLAND IN 131 COUNTRIES: 50 YEARS TRENDS	
L. LASSALETTA, G. BILLEN, B. GRIZZETTI, J. GARNIER .....	545
LIFE CYCLE ASSESSMENT OF ENVIRONMENTAL EMISSIONS FROM EXPORTED NEW ZEALAND DAIRY AND LAMB PRODUCTS AND THE IMPLICATIONS FOR NITROGEN FOOTPRINTING	
S. LEDGARD, M. BOYES, S. FALCONER.....	547
EFFECTS OF DIETARY PROTEASE ON N EMISSIONS FROM BROILER PRODUCTION: A HOLISTIC COMPARISON USING LIFE CYCLE ASSESSMENT	
I. LEINONEN, A.G. WILLIAMS.....	549
HOW LONG IS THE NITROGEN CASCADE?	
A. LEIP.....	551
ASSESSING THE ENVIRONMENTAL IMPACT FOR FOOD RECOMMENDATIONS IN EUROPE	
A. LEIP, H. TUOMISTO, J. WOLLGAST, C. DE CAMILLIS .....	553
CROP COMBINATIONS, MANAGEMENT AND ECONOMIC BENEFITS OF INTERCROPS ACROSS EUROPE: A REVIEW	
V. PAPPA, J. BADDELEY, A. PRISTERI, G. BERGKVIST, M. MONTI, M. RECKLING, N. SCHLAFKE, C.F. E. TOPP, C. WATSON.....	555
AN ANALYSIS OF CONSUMER-RELATED N FLOWS: FOOD AND MATERIAL USE	
M. PIERER, A. SCHRÖCK, W. WINIWARTER.....	557
WATER AND NITROGEN FOOTPRINT IN AN IRRIGATED CROP UNDER MINERAL AND ORGANIC FERTILIZATION	
M. REQUEJO MARISCAL, M.C. CARTAGENA CAUSAPE, R. VILLENA GORDO, A. ARCE MARTINEZ, F. RIBAS EL COROBARRUTIA, M.J. CABELLO CABELLO, A.M. TARQUIS ALFONSO, M.T. CASTELLANOS SERRANO .....	559
WILL A CHANGING CLIMATE LEAD TO INCREASED NITRATE INDUCED EUTROPHICATION?	
K. RICHARDS, A. PREMROV, C. COXON, K.V. HOOKER, R. HACKETT .....	562
NITROGEN FOOTPRINT: NITROGEN USE AND NITROGEN LOSS RELATED TO FOOD PRODUCTION IN CHINA	
Y. SHI, S. CUI, W. HUANG.....	564
QUANTIFICATION OF NITROGEN IN THE N2013 FOOD CHAIN	
T. TUMWESIGYE, A. LEIP, G. OLUPOT, M. BEKUNDA, P. MUSINGUZI .....	566
EUROPEAN DIETS, NITROGEN USE, EMISSIONS AND IMPACT ON HUMAN HEALTH	
H. WESTHOEK, T. ROOD, J. P. LESSCHEN, H. VAN GRINSVEN.....	568
NITROGEN FIXATION OF SELECTED FORAGE LEGUMES FOR SMALLHOLDER FARMERS IN UGANDA	
N. WRAGE-MOENNIG, J. KIGONGO, J. NAMBI-KASOZI, B.K. PAUL, J. ISSELSTEIN, B.L. MAASS .....	570
EFFECT OF FERTILIZER APPLICATION ON NITRIFICATION ACTIVITY AT ELEVATED TEMPERATURE SUBSEQUENT TO SOIL SOLARIZATION	
H. IHARA, N. KATO, S. TAKAHASHI, K. NAGAOKA, F. SATO, M. TAKEBE, T. KARASAWA.....	572